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ABSTRACT

The Student's Perception of Ability Scale (SPAS) was developed in response to a need for a reliable and valid instrument to measure academic, rather than general, self-concept in elementary school children. This scale was designed for use with children in Grades 3 to 6. Descriptive data on the SPAS were discussed in terms of its substantive, structural, and external validity. Normative data were given. More specifically, the scale was found to have six meaningful factors, good alpha and test-retest reliability, and strong discriminant and experimental validity. Validity data were presented which indicate that the SPAS clearly differentiates between children who have learning problems and those who do not, and that it correlates about .50 with school grades. The authors concluded that the SPAS measures a unique domain of academic self-concept and has good measurement characteristics. They also discussed possible practical and research implications for the scale. (Author/CTM)

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Department of Educational Psychology
Faculty of Education
The University of Alberta
Edmonton, Canada
T6G 2G5

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Technical Data on the Student's Perception of Ability Scale: An Instrument for Measuring Academic Self-Concept in Elementary School Children[1]

Frederic J. Boersma[2], James W. Chapman, and Thomas O. Maguire

University of Alberta, Edmonton
Canada

1978

Running Head: Student's Perception of Ability Scale

Abstract

The Student's Perception of Ability Scale (SPAS) was developed in response to a need for a reliable and valid instrument to measure academic, rather than general, self-concept in elementary school children. This scale was designed for use with children in Grades 3 to 6. Descriptive data on the SPAS are discussed in terms of its substantive, structural and external validity. Normative data were also given. More specifically, the scale was found to have six meaningful factors, good alpha and test-retest reliability, and strong discriminant and experimental validity. With regards to the latter case data were presented which indicate that the SPAS clearly differentiates between children who have learning problems and those who do not, and that it correlates about .50 with school grades. The authors conclude that the SPAS is measuring a unique domain of academic self-concept and that the scale has good measurement characteristics. They also discuss possible practical and research implications for the scale.

Technical Data on the Student's Perception of Ability Scale

Since the early 1950's there has been a rapid growth of interest in the self, particularly the self-concept. Wylie (1961), for example, reviewed over 400 pre-1961 studies of self-concept while Boshier (1970) updated Wylie's bibliography to include 500 post- and crucial pre-1961 titles dealing with self-attitude. As Wells and Maxwell (1976) suggest, the sheer volume of writings is indicative of its perceived utility in the theoretical understanding of human behaviors.

Volume of research, however, does not imply quality, and studies in the area of self-concept have been subject to considerable criticism for a number of years in terms of their quality. Most of this criticism has centered around the lack of standardization and validation of instruments. Crowne and Stephens (1961), for example, stated 16 years ago that there was a "relative absence of systematic efforts in test development, standardization, and validation in this area" (p. 119). Wylie (1961) concurred with this view when she concluded that information on the reliability and validity of "most" self-concept instruments was quite inadequate (p. 61). Although researchers have become increasingly aware of the crucial role of instrumentation in personality research, little improvement has taken place since 1961. Thus, in her recent publication on measurement and methodology in self-concept research, Wylie (1974) concluded that inadequate instrumentation (and faulty research design) reduces the contribution of most self-concept studies to a highly questionable status (p. 124).

In dealing with some of the reasons for the poor state of measurement in self-concept studies, Shavelson, Hubner, and Stanton (1976) remark that researchers tend to develop their own instruments for their own particular research problems, so that any one instrument is unlikely to be used more than a few times. Consequently, adequate validity and reliability data, gained through varied and repeated usage of an instrument, are seldom obtained.

Where instruments have received considerable empirical attention, problems have arisen in establishing construct validity and in demonstrating the relationship of scores on such instruments to other theoretically associated variables. The main reason for these problems, according to Wylie (1974), is that most of the commonly used self-concept instruments measure some aspect of a global self-regard, and as such tend to cover too many personality traits to allow for meaningful predictions of human behavior. Thus, Wylie (1974) proposes that "more molecular and carefully conceptualized constructs might have more scientific utility" (p. 325). These comments are particularly pertinent where attempts have been made to investigate the relationship between self-concept and school achievement.

Although several reviewers (eg., Aspy & Buhler, 1975; Bloom, 1976; Caplin, 1969; Cobb, Chisom, & Davis, 1975; Ligon, Hester, Baenen, & Matuszek, 1977; Purkey, 1970) note that children's feelings and attitudes about themselves are closely related to learning and performance in school, ambiguous and contradictory results render the overall findings inconclusive (Betteschen, Winne, & Wieden, 1977; Prendergarst & Binder, 1975). Brookover, Erickson, and Joiner (1967) believe that this inconclusive state of empirical research on self-concept and school achievement is not surprising because most self-concept scales employed in these studies are measures of general

self-concept. As such, they contain only a small number of items which relate to academic self-perceptions. Brookover et al. (1967) argue that if the academic dimension of self-concept was controlled, then the usual small but positive association between general measures of self-concept and school achievement "will drop to zero" (p. 24). When considering self-perceptions and their relationship to academic ability, therefore, it makes sense to employ instruments that deal with more discrete facets of the self-concept (Brookover et al., 1967; Shavelson, Hubner, & Stanton, 1976; Wylie, 1974).

Unfortunately, few instruments exist that deal specifically with academic self-concept. Most of those scales which have been used in measuring self-perception of academic ability have received the same inadequate psychometric development characteristic of most general self-concept instruments. One scale dealing with self-perception in school which has been relatively well developed, the Self-Concept of Ability Scale (Brookover, La Pere, Hamachek, Thomas, & Erickson, 1965) was constructed for use with junior and senior high school children. Thus, although self-perceptions of ability are recognized as important affective influences on achievement outcomes at all levels of schooling (eg., Bloom, 1976; Covington & Beery, 1976), there exists few, if any, well developed measures of academic self-concept for use with elementary school children. The Student's Perception of Ability Scale (SPAS--Boersma & Chapman, 1977) was constructed to meet this need.

The term self-perception of ability was used to reflect "academic self-concept" and refers to the individual's manner of describing and distinguishing himself as unique among others in terms of interactions and performances on academic school tasks. This self-concept of ability

results from the perceptions of the evaluations that significant others hold of the individual's ability (Brookover et al., 1965), in conjunction with amount of success experienced on academic tasks.

Validation of the Student's Perception of Ability Scale

Loevinger's (1957) validity monograph was used as a model to provide structure for the validation of the SPAS. Accordingly, the data in this paper will be reported under the headings of substantive validity, structural validity, and external validity.

Studies

Development of the SPAS involved four studies. Study 1 used a sample of 310 Grade 3 children drawn from five Edmonton Public Schools located in predominantly middle class areas. Data from this study were used to determine the factor structure of the SPAS. Study 2 involved 642 children in Grades 3 to 6 at two Edmonton suburban schools, also located in middle class areas. Results here were used to provide SPAS Full and Subscale intercorrelations, normative statistics, and estimates of discriminant validity between the SPAS and the Piers-Harris Children's Self Concept Scale (Piers, 1969), a measure of general self-concept. Study 3 involved identifying 81 learning-disabled and 81 control children from the Study 2 sample, and investigating individual differences between these groups in terms of self-perceptions (general and academic), and mother's perceptions of the children's abilities. Study 4 looked at the relationship between report-card grades and SPAS Full and Subscale scores for the 642 children in the normative study. Studies 3 and 4 were undertaken in an attempt to provide experimental validity for the SPAS.

Substantive Validity

Item Selection. In constructing the SPAS, a pool of some 200 questions relating to school performance and attitude was generated following consultation with elementary school teachers and examination of other self-concept measures. From this pool, 143 forced-choice "YES-NO" items were selected: 25 representing each of the five major elementary academic areas (reading, spelling, language arts, arithmetic, and penmanship), and 18 relating to school in general. An approximately equal number of positive and negative statements were used with items being randomly ordered in an attempt to reduce possible response set.

Structural Validity

The 143 item scale was then administered to 310 Grade 3 children in five middle class Edmonton public schools during the month of April. The students were informed that the questionnaire was designed to find out more about "how Grade 3 children felt about school and themselves." Assurances of the confidentiality of responses were given, and it was stressed that neither teachers nor parents would have access to the completed questionnaire booklets. Testing was conducted during regular classroom time, always with the same tester with instructions and items being read out aloud. Teachers were not present during testing.

Factor Analysis and Item Characteristics - Study 1. In order to explore the factor structure of the scale, a principal components analysis was applied which resulted in the extraction of 30 components with roots greater than one. The principal components solution accounted for 58.86% of the total variance. Four varimax rotations were then carried out, using as input the first four, five, six, and seven factors from the principal components solution. The six factor solution appeared most meaningful, and was thus chosen to describe

the factor structure of the SPAS. These six factors accounted for 31.6% of the total variance. Following an examination of the loading matrix, the 12 items with the highest loadings on each of the first five components, and the ten with the highest loadings on the sixth component were selected to comprise the final set of SPAS subscales. Sixty-five of the 70 selected items had loadings of $\geq .400$, while five had loadings of $\geq .300$ (see Table 1). No single item was used in more than one subscale.

Insert Table 1 about here

An examination of the difficulty indices of the 70 items included in the SPAS revealed that 64 fell within the .30 to .85 range, whereas the remaining six had difficulty levels of between .85 and .91. These six items all loaded on the sixth component and were retained on that basis.

The first factor was made up of negative statements reflecting general perceptions of ability, and as such, the degree to which the child's self-evaluations were negative or poor. Conversely, high scores on this factor are indicative of positive perceptions of general ability. Accordingly, this factor has been labelled Perception of General Ability (General Ability). Examples of items comprising this factor are: "I find it hard to understand what I have to do;" "I make many mistakes in school;" and, "I have trouble telling others what I mean." The second factor contained statements which focused primarily on perceptions of arithmetic ability, such as, "I have difficulty getting my arithmetic finished on time;" and, "I am good at arithmetic." This component was named Perception of Arithmetic Ability (Arithmetic). The third factor consisted mainly of items reflecting

satisfaction (enjoyment) with school related activities. This factor was labelled General School Satisfaction (School Satisfaction). Among statements making up this scale were: "I like going to school;" "I like answering questions;" and "I like making up endings to stories." The fourth factor was made up mainly of items dealing with self-evaluations of reading and spelling ability. This component has been referred to as Perception of Reading and Spelling Ability (Reading/Spelling). Sample items here are: "I am a good reader;" and, "I find spelling hard." Factor five contained statements relating to neatness and tidiness of written work. Accordingly, this component was named Perception of Penmanship and Neatness (Penmanship/Neatness). Examples of items included in this factor are: "I am good at printing;" and, "My school work is usually untidy." Factor six reflected a willingness on behalf of the child to express his/her "smartness," and as such this component is probably indicative of the amount of confidence the child has in his/her academic abilities. Thus, this factor has been labelled Confidence in Academic Ability (Confidence). Examples of items making up this factor are: "I always understand everything I read;" and, "I am a smart kid."

Intercorrelations and Standardization - Study 2. Interscale correlations and normative data on the SPAS were obtained by administering the scale in groups to 642 children in Grades 3 to 6 during the months of April and May. Testing time in each case was approximately 20 minutes. The sample contained seven Grade 3, seven Grade 4, six Grade 5, and five Grade 6 classes. All children were from middle class suburban elementary schools within the Edmonton area.

As shown in Table 2, Full Scale with Subscale correlations range from .541 (School Satisfaction) to .770 (Reading/Spelling). In terms of subscale intercorrelations,

the School Satisfaction factor has the weakest relationship with other factors (median r = .268), while the Spelling/Reading factor has the strongest (median r = .387). These low median correlations suggest that each subscale is quite independent of each other, whereas the relatively high correlations with the Full Scale scores indicate that together they appear to be tapping the domain of academic self-concept.

Insert Table 2 about here

In terms of normative data, it can be seen from Table 3 that the mean Full Scale SPAS score is 46.24, with a standard deviation of 11.71, and a standard error of measurement of 3.41. Subscale mean scores, with the exception of Confidence, vary from 7.89 to 9.17, standard deviations from 2.78 to 3.01, and standard errors from 1.19 to 1.42. For the ten-item Confidence scale, the mean was 4.21, the standard deviation 2.25, and the standard error 1.26.

Insert Table 3 about here

A more detailed breakdown of the data as a function of sex is found in Table 4. Interestingly, several sex differences appear. For example, for the 341 boys the total mean score was 44.75 (SD = 11.87, SE = 3.48), whereas for the 301 girls it was 47.92 (SD = 11.28, SE = 3.29). This 3.17 point difference, with girls having higher perceptions of ability scores than boys, is statistically significant ($t = 3.47$, $df = 640$, $p < .001$). Other significant differences in favor of girls were noticeable on the School Satisfaction ($p < .001$), Reading/Spelling ($p < .01$), and Penmanship/

Neatness ($p < .001$) subscales. These differences are in agreement with literature which suggests that girls tend to be more proficient in reading/spelling and neatness, and tend also to have more positive attitudes toward school. Deciles for Full Scale SPAS scores for boys and girls are presented in Table 5.

Insert Tables 4 and 5 about here

Specific normative data as a function of grade level and sex are reported in Table 6. Here there were no significant differences between Full Scale and Grade level scores. But sex differences were observed at Grades 3, 4 and 5, with strongest sex effects being associated with Grades 4 and 5. A detailed analysis of these data as a function of individual classes and schools failed to reveal the source of these differences. Thus, it appears that the School Satisfaction and Penmanship/Neatness subscales are the main differentiating factors between boys and girls.

Insert Table 6 about here

Reliability. Estimates of internal consistency were determined by Cronbach's alpha (α). The alpha for the Full Scale SPAS was .915 (Table 3), whereas Arithmetic, Reading/Spelling, and Penmanship/Neatness values were between .822 and .855. General Ability was .785, School Satisfaction .741, and Confidence .686. These coefficients suggest that items within individual subscales are relatively homogeneous, and that all items considered together appear to be tapping a common domain. Alpha coefficients presented in Table 4 for the total sample as a function of sex, and in Table 6 for Grade level and

sex lend further support to the above conclusion.

Test-retest reliability was determined over a four to six week interval for the Study 2 sample (N = 603). These coefficients for Full and Subscale scores are presented in Table 3. The stability coefficient for the Full SPAS was .834, whereas subscale values ranged from .714 to .824. The above test-retest data indicate that the SPAS is a relatively stable instrument over time, and that the most stable and internally consistent subscale was Reading/Spelling.

External Validity

First, in an attempt to provide discriminant validity for the SPAS, the Piers-Harris Children's Self-Concept Scale was correlated with the SPAS on 622 children from the Study 2 sample. Piers-Harris data were collected two days following the administration of the SPAS, which accounts for slight reduction in sample size. Correlation coefficients between the SPAS and the Piers-Harris Full and Subscales ranged from -.029 to .078, with none being significant at the .05 level (see Table 7). These data indicate that the two scales are measuring two distinct domains, and are supportive of the notion that academic self-concept is an entity distinguishable from general self-concept. The findings further support the contention of various writers (e.g., Brookover et al., 1967; Shavelson, Hubner & Stanton, 1976; Wylie, 1974) that self-concept is a multifaceted construct which is best utilized at more molecular levels.

Insert Table 7 about here

Next, from the Study 2 sample, 81 learning disabled (LD) and 81 Control children in Grades 3 to 6 were identified. The LD children were all currently receiving part-time remedial assistance (about 1/2 hour per day) on the basis of a 1-1/2 to 2 year deficit in one or more academic areas. The major area of deficiency was reading in all cases. The Control subjects were randomly selected from the same classrooms after having been stratified on sex. In terms of age and socio-economic status (based on father's occupations and classified according to the Blishen Scale, Blishen, 1967), there were no statistically significant differences between the groups.

Ability estimates for Grades 3 and 4 were obtained by Otis-Lennon--Form K IQ scores (Otis & Lennon, 1969), whereas Canadian Lorge-Thorndike IQ's (Lorge, Thorndike, & Hagen, 1967) were used for Grades 5 and 6. There were no significant differences between combined Grade 3 and 4 mean IQ scores ($\bar{X}_{LD} = 103.24$; $\bar{X}_{C} = 107.22$; $t = 1.86$; $df = 88$; $p > .05$), although there was a trend for Controls to score higher. On the other hand, combined Grade 5 and 6 mean IQ scores were significantly higher for Controls ($\bar{X}_{LD} = 97.89$; $\bar{X}_{C} = 109.80$; $t = 5.26$; $df = 70$; $p < .001$). In spite of these differences, it should be noted that both groups were within the average range, and that the tendency for LD children to have lower scores is probably due to reading difficulties experienced by them on the "group administered" IQ tests, rather than intellectual differences between the groups per se.

An analysis of report card grades for these students, using a five-point scale, indicated that in reading, spelling, arithmetic, language, penmanship, and social studies, the LD children received significantly lower grades than

the Control children (all p's < .001). The grade point average for the LD group was 2.96, whereas for the Control group it was 3.77.

Study 3 involved investigating LD and Control group differences on the Piers-Harris and the SPAS, mothers' perceptions of their children's ability as measured by the SPAS, and a look at the relationship between SPAS full and subscale scores and report card grades at the end of the year.

The first part of this study involved running seven three-way analyses of variance (Group x Sex x Grade) on Piers-Harris full and subscale scores. These results revealed that none of the scales differentiated statistically between the two groups, nor did they even approach significance. In addition, there were no sex or major interaction effects. These data thus indicate that the LD and Control children have similar general self-concepts, at least as measured by the Piers-Harris. SPAS Full and Subscale scores were then analyzed in the same manner. It is interesting to note here that, with the exception of Penmanship/Neatness, all scales differentiated between the groups (see Table 8). The overall effect here was more negative perceptions being associated with LD children. Also of importance is the fact that there were no significant grade effects, and only one significant sex effect--Penmanship/Neatness. This sex difference probably is not surprising in that girls are often seen as being neater and doing tidier written work. There were no significant interactions.

Insert Table 8 about here

In short, whereas the Piers-Harris failed to differentiate LD and Control children, the SPAS did, and quite clearly so. The failure to obtain grade effects on the SPAS is consistent with the normative data presented in Table 6. In that self-perceptions of academic ability differences were observed between the groups at all grade levels the results suggest that academic self-concept may indeed be substantially formed by the time the student gets to Grade 3. Overall, the ability of the SPAS to distinguish between children with learning problems and students who are performing "adequately" indicates that the scale has good experimental validity.

The second part of Study 3 involved having mothers complete the SPAS "as they thought their child would." Results from the three-way analyses of variance carried out here are also presented in Table 8. These findings are consistent with the data for children in that mothers of LD children rated their child's perceptions of ability as being significantly lower than those of control mothers for all scales, except Penmanship/Neatness. A significant sex effect was also observed here with mothers of girls rating their child more positively than mothers of boys. There were no significant grade effects, and only one interaction where a significant group by grade effect on the Reading/Spelling subscale ($F = 3.41$; $df = 3,146$; $p = .019$) was found. This was accounted for by an increasingly positive attitude of mothers of the LD subjects with respect to their children's perceptions of ability in reading and spelling as they progressed in school.

The final aspect of the SPAS investigated was its relationship to end-of-year course grades (Study 4). In terms of specific academic course-related subscales (Arithmetic, Reading/Spelling, and Penmanship/Neatness)

the following should be noted (See Table 9). The Arithmetic subscale correlated most highly with Report Card Grades in Arithmetic (r = .395), while the Reading/Spelling subscale correlated most highly with Report Card Grades in Spelling (r = .519), Reading (r = .472) and Language (r = .399). In addition, it is interesting to note that the SPAS Reading/Spelling subscale had the strongest correlation of any scale with Grade Point Average (r = .496). For the Penmanship/Neatness subscale, the highest correlation was with Report Card Grades in Penmanship (r = .397). In terms of these specific SPAS subscales, then, there is a moderate relationship with corresponding Report Card course grades.

For the more general SPAS subscales (General Ability, Confidence, and School Satisfaction) the following should be observed. The Perception of General Ability subscale had moderate correlations with Reading, Spelling, Arithmetic, and Language (r = .326 to .391), and correlated .407 with Grade Point Average. For the SPAS Confidence subscale, the highest correlation was with Grade Point Average (r = .395), followed by Arithmetic (r = .357). The weakest correlations were obtained for the School Satisfaction subscale. Here, all coefficients were low, ranging from .026 (Arithmetic) to .141 (Penmanship/Neatness). These low correlations suggest that scores on the School Satisfaction subscale are not necessarily related to success or failure in school. Finally, it should be noted, in terms of Full Scale SPAS scores that the highest correlation was associated with Grade Point Average (r = .489), while individual subject correlations ranged from .336 (Penmanship) to .434 (Spelling).

Insert Table 9 about here

Summary and Discussion

As previously noted, the SPAS was developed in response to a need for a reliable and valid instrument to measure academic, rather than general, self-concept in elementary school children in Grades 3 to 6. Four studies were carried out over a two and one-half year period in an attempt to provide substantive, structural and external validity for the scale.

Item and factor analyses of a pilot 143-item scale led to the construction of the present 70-item SPAS. This scale has six meaningful factors which relate to perceptions of ability in specific school subjects, and to more general school attitudes. In terms of reliability, the SPAS has good internal consistency and stability, thus suggesting that the scale is a dependable instrument with strong internal validity. Normative data were obtained on a sample of 642 children in Grades 3 to 6. While there were no grade level effects, girls tended to score higher on the SPAS than boys. In view of this, norms were presented for both girls and boys.

Discriminant validity was estimated from correlations between the SPAS and the Piers-Harris test of general self-concept. Negligible correlations between the two scales and subscales suggest that the SPAS is tapping something quite different from general self-concept. Furthermore, these findings are supportive of other researchers' calls for instruments which "measure more molecular" facets of self-concept (eg., Brookover et al., 1965, 1967; Shavelson, Hubner, & Stanton, 1976; Wylie, 1961, 1974).

In terms of experimental validity, the data indicated that the SPAS clearly differentiates between children who have learning problems and those who do not. This finding is in keeping with the theoretical notion that successful and unsuccessful students develop different self-perceptions

of ability (Bloom, 1976; Brookover et al., 1965, 1967; Covington & Beery, 1976), and indicates that the SPAS is sensitive to those differences.

Insofar as school achievement is concerned, the .489 correlation between the SPAS and grade point average is consistent with other reported self-concept measures and school grades (Bloom, 1976). In this respect, the SPAS appears to be moderately predictive of school success.

Further validation of the SPAS is presently being undertaken by the authors, and is focussing on establishing the relationship between academic self-concept and other cognitive measures (eg., IQ, standardized achievement tests) and affective variables (eg., expectancy of academic performance, locus of control, and perceptions of significant others with regards to school achievement). More extensive research with learning disabled children is also underway. As it now stands the scale seems valid for evaluating affective components of remediation and in identifying high-risk elementary school children. It might also prove useful for measuring change in perceptions of ability, and for longitudinal research.

In summary, this paper represents a systematic attempt to develop, standardize, and validate a measure of academic self-concept. Results indicate that the SPAS has good psychometric characteristics, factor structure, and promising external validity for assessing this variable. As such, the SPAS should fulfill the need for a reliable and valid measure for assessing academic self-concept for in-elementary school students.

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Footnote

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[2]Copies of the instrument may be obtained from Dr. F. J. Boersma, Department of Educational Psychology, University of Alberta, Edmonton, Alberta, Canada T6G 2G5

Table 1

Varimax Factor Loadings on the SPAS for Grade 3 Children (N = 310)

I General Ability		II Arithmetic		III School Satisfaction		IV Reading/ Spelling		V Penmanship/ Neatness		VI Confidence	
Item	Loading	Item	Loading	Item	Loading	Item	Loading	Item	Loading	Item	Loading
4	.516	5	.482	11	.481	10	.491	2	.463	1	.441
6	.555	9	.447	16	.663	13	-.511	8	-.719	3	.522
14	.436	20	-.422	18	.590	15	.547	12	-.456	7	.442
22	.449	27	.508	21	.519	17	-.467	26	.665	19	.431
24	.518	34	-.531	23	.511	25	.507	28	-.309	39	.373
48	.555	35	-.546	30	.490	31	.541	29	-.331	42	.402
50	.524	37	.585	36	.541	54	.591	32	-.695	43	.417
53	.484	45	-.402	40	.661	56	.510	33	-.497	49	.593
61	.431	51	-.536	44	.467	58	-.584	38	.518	52	.503
64	.417	55	.558	46	.527	59	.449	41	.385	70	.381
65	.519	66	.665	47	.498	60	.568	57	.546		
68	.468	69	.480	67	.609	62	-.463	63	-.522		

Table 2

SPAS Full Scale and Subscale Intercorrelations (N=642)[a]

	General Ability	Arithmetic	School Satisfaction	Reading/ Spelling	Penmanship/ Neatness	Confidence
General Ability						
Arithmetic	.509					
School Satisfaction	.155	.268				
Reading/Spelling	.571	.387	.306			
Penmanship/Neatness	.350	.335	.314	.382		
Confidence	.539	.454	.208	.506	.278	
Full Scale	.760	.718	.541	.770	.653	.692

[a]For all values $p < .001$

Table 3

Statistics for Full and Subscale SPAS Scores

Summed Over Grades 3, 4, 5 and 6 (N = 642)

	Number of items	Mean	SD	SE	α	Test-retest[a]
Full Scale	70	46.24	11.71	3.41	.915	.834
General Ability	12	7.91	3.01	1.40	.785	.750
Arithmetic	12	9.17	3.01	1.21	.837	.787
School Satisfaction	12	7.99	2.78	1.42	.741	.714
Reading/Spelling	12	9.07	3.13	1.19	.855	.824
Penmanship/Neatness	12	7.89	3.00	1.27	.822	.780
Confidence	10	4.21	2.25	1.26	.686	.742

[a]Test-retest interval 4 to 6 weeks (N = 603)

Table 4

Statistics for Full and Subscale SPAS

Scores as a Function of Sex

	Boys (n=341)				Girls (n=301)				
	$\bar{X}$	SD	SE	α	$\bar{X}$	SD	SE	α	t
Full Scale	44.75	11.87	3.48	.914	47.92	11.28	3.29	.915	3.47***
General Ability	7.82	2.99	1.41	.777	8.01	3.02	1.37	.794	.79
Arithmetic	9.11	3.10	1.21	.849	9.22	2.89	1.22	.823	.47
School Satisfaction	7.46	2.93	1.44	.757	8.58	2.47	1.37	.690	5.25***
Reading/Spelling	8.74	3.23	1.24	.853	9.44	2.97	1.13	.854	2.86**
Penmanship/Neatness	7.33	3.12	1.32	.822	8.52	2.73	1.19	.809	5.15***
Confidence	4.28	2.24	1.29	.671	4.14	2.25	1.22	.707	.79

* $p < .05$
** $p < .01$
*** $p < .001$

Table 5

Deciles for SPAS Normative Data

Boys		Girls
Raw Score	Decile	Raw Score
29	10	33
35	20	39
40	30	43
43	40	46
47	50	49
49	60	52
52	70	54
54	80	58
58	90	62

Table 6

Descriptive Statistics for Full and Subscale SPAS

Scores as a Function of Sex and Grades

Level	Boys				Girls				
	$\bar{X}$	SD	SE	α	$\bar{X}$	SD	SE	α	t
Grade 3		(n = 84)				(n = 87)			
Full Scale	47.17	11.83	3.44	.916	48.36	12.29	3.27	.929	.64
General Ability	7.86	2.95	1.44	.762	7.76	3.16	1.38	.809	.21
Arithmetic	9.13	3.22	1.17	.868	8.71	2.97	1.28	.816	.88
School Satisfaction	7.85	2.88	1.40	.762	9.09	2.65	1.29	.763	2.93**
Reading/Spelling	9.40	2.81	1.18	.823	9.91	2.55	1.10	.813	1.24
Penmanship/Neatness	8.01	3.08	1.31	.821	8.34	3.03	1.21	.841	.71
Confidence	4.92	2.52	1.29	.739	4.54	2.36	1.28	.705	.89
Grade 4		(n = 92)				(n = 77)			
Full Scale	41.91	12.75	3.53	.924	49.03	11.45	3.19	.922	3.82***
General Ability	7.07	3.20	1.42	.804	7.91	3.09	1.37	.802	1.73*
Arithmetic	8.34	3.43	1.26	.865	9.26	2.81	1.21	.814	1.92*
School Satisfaction	7.72	3.09	1.42	.788	9.13	2.35	1.32	.686	3.37***
Reading/Spelling	8.32	3.42	1.27	.862	9.38	3.04	1.11	.867	2.13*
Penmanship/Neatness	6.64	3.10	1.35	.812	9.40	2.38	1.15	.764	6.54***
Confidence	3.84	2.13	1.25	.656	4.21	2.29	1.15	.745	1.08
Grade 5		(n = 91)				(n = 71)			
Full Scale	45.29	12.75	3.50	.883	47.83	9.96	3.28	.819	1.42
General Ability	8.12	3.20	1.41	.738	8.11	3.02	1.35	.800	.02
Arithmetic	9.36	3.43	1.20	.822	9.61	2.68	1.65	.811	.52
School Satisfaction	7.31	3.09	1.43	.776	8.54	2.07	1.39	.549	3.03**
Reading/Spelling	8.84	3.42	1.24	.836	9.13	3.28	1.14	.880	.55
Penmanship/Neatness	7.30	3.10	1.32	.811	8.37	2.42	1.22	.747	2.47**
Confidence	4.36	2.13	1.32	.557	4.08	2.01	1.20	.644	.86
Grade 6		(n = 74)				(n = 66)			
Full Scale	44.89	11.90	3.33	.922	46.14	10.79	3.24	.910	.65
General Ability	8.36	2.83	1.33	.779	8.36	2.71	1.34	.757	0
Arithmetic	9.76	2.58	1.14	.805	9.44	3.01	1.14	.857	.67
School Satisfaction	6.84	2.52	1.43	.678	7.32	2.28	1.44	.602	1.06
Reading/Spelling	8.42	3.51	1.23	.877	9.21	2.98	1.16	.848	1.44
Penmanship/Neatness	7.46	3.09	1.23	.842	8.20	2.90	1.15	.842	1.46
Confidence	4.00	2.17	1.26	.662	3.61	2.17	1.12	.733	1.06

* $p < .05$
** $p < .01$
*** $p < .001$

Table 7

Product-Moment Correlations of SPAS and Piers-Harris

Full Scales and Subscales (N = 622)

	PIERS-HARRIS						
SPAS	Behaviour	Intellectual and School Status	Physical Appearance	Anxiety	Popularity	Happiness	Full Scale
General Ability	.058[a]	-.002	-.011	.016	.006	-.020	.035
Arithmetic	-.029	.027	.028	-.023	.000	-.020	.014
School Satisfaction	.034	.054	.054	.028	.078	.060	.072
Reading/Spelling	.032	.028	.014	.033	.008	.007	.040
Penmanship/Neatness	-.004	.020	.041	.012	.006	-.002	.018
Confidence	.030	-.009	.021	-.023	-.017	.048	.016
Full Scale	.029	.030	.041	.012	.020	.014	.048

[a]For all values $p > .05$

Table 8

Summary Table of SPAS F Values

as a Function of Group[a]

Scale	Children				Mothers			
	LD[b]	Control	F[c]	p	LD	Control	F	p
Full Scale	37.88	49.72	33.58	.000	38.61	52.15	41.19	.000
General Ability	5.67	8.37	29.12	.000	7.64	10.27	31.10	.000
Arithmetic	7.33	9.68	17.55	.000	7.00	9.58	13.71	.000
School Satisfaction	7.44	8.73	7.19	.008	7.48	9.06	12.13	.001
Reading/Spelling	6.89	10.07	45.03	.000	6.25	10.35	59.63	.000
Penmanship/Neatness	7.22	8.22	3.39	.068	7.86	7.69	.001	N.S.
Confidence	3.32	4.64	12.62	.000	2.77	5.25	45.72	.000

[a] n = 81 per group
[b] Mean Values
[c] df = 1, 146

Table 9

SPAS and Report Card Grade Correlations (N = 630)

SPAS	Grades						
	Reading	Spelling	Arithmetic	Language	Penmanship	Social Studies	Grade Point Average
General Ability	.391[a]	.326	.344	.338	.196	.297	.407
Arithmetic	.224	.283	.395	.269	.199	.248	.350
School Satisfaction	.092[c]	.115[b]	.026[d]	.067[d]	.141	.097[d]	.114[b]
Reading/Spelling	.472	.519	.321	.399	.243	.349	.496
Penmanship/Neatness	.108[b]	.193	.102[b]	.164	.397	.153	.235
Confidence	.335	.326	.357	.302	.182	.331	.395
Full Scale	.398	.434	.376	.378	.336	.358	.489

[a] All non-designated correlations $p < .001$
[b] $p < .01$
[c] $p < .05$
[d] Non-significant